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09/492,373 01/27/00 HORIKOSHI

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EXAMINER

SHOSHOC

ART UNIT

PAPER NUMBER

1714

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4

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No. 09/492,373	Applicant(s) Horikoshi et al.
Examiner Callie Shosho	Art Unit 1714

— The MAILING DATE of this communication appears on the cover sheet with the correspondence address —

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on _____

2a) This action is FINAL. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle* 1035 C.D. 11; 453 O.G. 213.

4) Claim(s) 1-18 is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-18 is/are rejected.

7) Claim(s) _____ is/are objected to.

8) Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on _____ is/are objected to by the Examiner.

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) All b) Some* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) Notice of References Cited (PTO-892)

16) Notice of Draftsperson's Patent Drawing Review (PTO-948)

17) Information Disclosure Statement(s) (PTO-1449) Paper No(s). 3

18) Interview Summary (PTO-413) Paper No(s). _____

19) Notice of Informal Patent Application (PTO-152)

20) Other: _____

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DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "14" and "16" have both been used to designate drive motor on page 6, lines 16 and 20-21 respectively. Correction is required.

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "100" has been used to designate both solvent and ink on page 9, line 4. Correction is required.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 5, 10, and 12-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) Claim 5 recites "wherein said copolymer has a softening point (by a flow tester)..".

The scope of the claim is confusing given that it is not clear why "by a flow tester" is in

parentheses. Is the softening point actually measured by a flow tester? If so, it is suggested that “(by a flow tester)” is replaced with “measured by a flow tester”.

(b) Claim 12 recites that the copolymer includes “styrene and styrene derivative” while claim 13 recites that the copolymer includes “alkyl acrylate, alkyl methacrylate, and derivative thereof”. In each of the claim is not clear what is meant by derivates. What compounds are encompassed by this phrase. For instance, do alkyl acrylate and alkyl methacrylate derivates include hydroxyalkyl (meth)acrylates, aminoalkyl (meth)acrylates, etc.

(c) Claim 12 recites that the copolymer includes styrene and styrene derivative “in the whole”. It is not clear what is meant by this phrase. Is the copolymer comprised of this amount of styrene? Similar arguments are made with respect to claim 13 which discloses that the copolymer includes alkyl acrylate, alkyl methacrylate, and derivative thereof “in the whole”.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

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6. Claims 1-2, 4, 6-14, and 16-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsutsumi et al. (U.S. 6,031,019).

Tsutsumi et al. disclose ink jet ink comprising 1-30% particle of copolymer obtained from 35-98% monomer such as styrene and its derivatives or alkyl (meth)acrylates, solvent that is liquid at room temperature, and colorant which is a dye or pigment that is either absorbed onto the surface of the copolymer particle, dispersed in the copolymer particle, or dissolved in the solvent. It is further disclosed that the copolymer is prepared by emulsion polymerization and has a glass transition temperature of 40⁰-250⁰ C. There is further disclosed an ink cartridge comprising the above ink. Further, it is disclosed that the ink is printed using a recording device that comprises a piezoelectric element and ink cartridge (col.1, lines 9-15, col.3, line 65-col.4, line 36, col.4, line 53-col.5, line 5, col.6, line 65-col.7, line 9, col.8, lines 13-14 and 17-18, col.11, lines 27-51 and 56-60, col.14, lines 41-43, and col.15, lines 40-44).

In light of the above, it is clear that Tsutsumi et al. anticipates the present claims.

7. Claims 1-2, 4-5, 8-11, 14, and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Belmont et al. (U.S. 5,630,868).

Belmont et al. disclose an ink jet ink comprising 10% styrene/acrylic copolymer particle having glass transition temperature of 67⁰ C and softening temperature of 128⁰ C, solvent which is liquid at room temperature, and colorant which is pigment that is dispersed in the solvent. It is also disclosed that the ink is printed using ink jet printer including those comprising piezoelectric

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head where such ink jet printer would inherently possess an ink cartridge which would house the ink (col.1, lines 37-45, col.4, lines 30-35 and 46-49, col.8, lines 14-27, and example 22).

In light of the above, it is clear that Belmont et al. anticipates the present claims.

8. Claims 1-4, 8-14, and 16-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Patel et al. (U.S. 5,977,210).

Patel et al. disclose an ink jet ink comprising 16.25% copolymer particle obtained from, for instance, 18% butyl acrylate and 82% styrene, solvent that is liquid at room temperature, and colorant which is dispersed in solvent wherein the copolymer particle has volume average diameter of 0.1-1 micron. It is further disclosed that the copolymer is prepared by emulsion polymerization and has glass transition temperature of, for instance, 60⁰ C. It is further disclosed that the ink is printed using ink jet printer including those comprising piezoelectric head where such ink jet printer would inherently possess an ink cartridge which would house the ink (col.1, lines 6-7 and 64-67, col.2, lines 56-61, col.4, lines 51-66, col.5, lines 22-26, col.6, lines 58-60, col.7, lines 36-38, and example 1).

In light of the above, it is clear that Patel et al. anticipates the present claims.

9. Claims 1-2, 5-6, 9-14, and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 767225.

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EP 767225 disclose an ink jet ink comprising 0.2-20% copolymer particle obtained from styrene and alkyl (meth)acrylate monomer, solvent that is liquid at room temperature, and colorant which is pigment that is dispersed in the copolymer wherein the copolymer has softening temperature of 50⁰-150⁰ C. It is further disclosed that the copolymer is produced by emulsion polymerization. There is also disclosed an ink cartridge comprising the above ink which is printed using a recording device comprising a piezoelectric head and ink cartridge (page 4, lines 30-33, page 4, line 55-page 5, lines 14, page 5, lines 26-27 and 53-58, page 10, lines 55-58, page 11, lines 22-23, and page 14, lines 44-45).

In light of the above, it is clear that EP 767225 anticipates the present claims.

10. Claims 1 and 9-14 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 379678.

JP 379678 discloses an ink jet ink comprising copolymer particle obtained from 40% styrene and 48% butyl acrylate, colorant, and solvent that is liquid at room temperature (pages 1-2).

In light of the above, it is clear that JP 379678 anticipates the present claims.

11. Claims 1-2, 6, 9-11, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by JP 10120957.

JP 10120957 disclose an ink jet ink comprising 3-30% copolymer particle obtained from styrene and alkyl (meth)acrylate monomer, colorant dissolved in the copolymer, and solvent

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which is liquid at room temperature wherein the polymer is made by emulsion polymerization (pages 1-4).

In light of the above, it is clear that JP 10120957 anticipates the present claims.

12. Claims 1-2, 4, and 6-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Jones et al. (U.S. 5,936,008).

Jones et al. disclose an ink jet ink comprising 6-20% copolymer particle obtained from, for instance, 82% styrene and 18% butyl acrylate, solvent which is liquid at room temperature, and colorant which is dissolved in solvent and is either dispersed in copolymer or coats the surface of the copolymer. It is further disclosed that the copolymer is produced by emulsion polymerization and has glass transition temperature of 68° C (col.5, line 65-col.6, line 27, col.7, lines 20-27 and 41-59, col.10, lines 15-25, col.12, lines 10-20, and examples 1 and 7).

In light of the above, it is clear that Jones et al. anticipates the present claims.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

15. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsumi et al. (U.S. 6,031,019), EP 767225, Jones et al. (U.S. 5,936,008), or JP 10120957 any of which in view of Patel et al. (U.S. 5,977210).

The disclosures with respect to Tsutsumi et al., EP 767225, Jones et al., and JP 10120957 described above in paragraphs 6, 9, 12, and 1,1 respectively, are incorporated here by reference.

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The difference between Tsutsumi et al., EP 767225, Jones et al., or JP 10120957 and the present claimed invention is the requirement in the claims of the volume average particle diameter of the copolymer.

Neither Tsutsumi et al., EP 767225, Jones et al., or JP 10120957 explicitly disclose the volume average particle diameter of their copolymer.

On the one hand, given that Tsutsumi et al., EP 767225, Jones et al., and JP 10120957 each produce their copolymer by emulsion polymerization as presently claimed, it would have been natural for one of ordinary skill in the art to infer that the copolymers intrinsically possess the same volume average particle diameter as presently claimed, and thus one of ordinary skill in the art would have arrived at the claimed invention.

On the other hand, Patel et al., which is drawn to ink jet inks, disclose the use of copolymer having volume average particle size of 0.1-1 micron in order to produce an ink that will not clog the printer nozzles (col.3, lines 14-15 and col.4, lines 57-59).

In light of the motivation for using copolymer having specific volume average particle diameter disclosed by Patel et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use copolymer with such volume average particle diameter in the ink of either Tsutsumi et al., EP 767225, Jones et al., or JP 10120957 in order to produce an ink which will not clog the printer nozzles, and thereby arrive at the claimed invention.

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16. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsumi et al. (U.S. 6,031,019), Patel et al. (U.S. 5,977,210), or Jones et al. (U.S. 5,936,008) any of in view of either *Polymer Science Dictionary* or Fujisawa et al. (U.S. 5,997,136).

The disclosures with respect to Tsutsumi et al., Patel et al., and Jones et al. described above in paragraphs 6, 8, and 12, respectively, are incorporated here by reference.

The difference between either Tsutsumi et al., Patel et al., or Jones et al. and the present claimed invention is the requirement in the claims of the softening temperature of the copolymer.

On the one hand, given that Tsutsumi et al., Patel et al., and Jones et al. each disclose copolymers identical to those presently claimed, i.e. obtained from the same types and amounts of monomers, it would have been natural for one of ordinary skill in the art to infer that the copolymers intrinsically possess the same softening temperature as presently claimed, and thereby arrive at the claimed invention. Evidence to support this position is found in *Polymer Science Dictionary* (page 526) which discloses that the value of the softening point for polymers lies in the vicinity of the glass transition temperature of the polymer. Given that Tsutsumi et al., Patel et al., and Jones et al. each disclose copolymer having glass transition temperature identical to that presently claimed, it is clear, in light of the teaching in *Polymer Science Dictionary*, that the softening temperature of the copolymer of either Tsutsumi et al., Patel et al., or Jones et al. will also overlap the softening temperature as presently claimed.

On the other hand, Fujisawa et al., which is drawn to ink jet inks, disclose that the softening temperature of polymers utilized in ink jet inks range from 50° -120° C wherein such

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temperature allows the ink to be heated quickly so that the ink dot is formed before penetration of ink into recording medium occurs so that feathering of the ink on the recording medium is prevented (col.3, lines 13-35).

In light of the motivation for using copolymer with specific softening temperature disclosed by Fujisawa et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use copolymer with such softening temperature in the ink of either Tsutsumi et al., Patel et al., or Jones et al. in order to produce an ink which does not feather, and thereby arrive at the claimed invention.

17. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsutsumi et al. (U.S. 6,031,019), Patel et al. (U.S. 5,977,210), and EP 767225 any of which in view Nkansah et al. (U.S. 5,962,580).

The disclosures with respect to Tsutsumi et al., Patel et al., and EP 767225 described above in paragraphs 6, 8, and 9, respectively, are incorporated here by reference.

The difference between either Tsutsumi et al., Patel et al., or EP 767225 and the present claimed invention is the requirement in the claims of surfactant covering a surface of the copolymer.

Tsutsumi et al., Patel et al., and EP 767225 each disclose a surfactant and copolymer, but there is no explicit disclosure in any of the references that the surfactant covers a surface of the copolymer.

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On the one hand, given that the surfactant and copolymer are mixed together in either Tsutsumi et al., Patel et al., or EP 767225 in order to produce an ink, it would have been natural for one of ordinary skill in the art to infer that the surfactant intrinsically covers a surface of the copolymer as a result of the mixing process, and thereby arrive at the claimed invention.

On the other hand, Nkansah et al., which is drawn to aqueous coating compositions, disclose the use of polymer covered with surfactant in order to improve the color acceptance of the composition (col.1, lines 38-50 and col.4, lines 5-20).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to cover the surface of the copolymer with surfactant in the ink of either Tsutsumi et al., Patel et al., or EP 767225 in order to produce an ink that has improved color acceptance, and thereby arrive at the claimed invention.

18. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over EP 767225 in view of *Polymer Science Dictionary* or Fujisawa et al. (U.S. 5,997,136).

The disclosure with respect to EP 767225 described above in paragraph 9 is incorporated here by reference.

The difference between EP 767225 and the present claimed invention is the requirement in the claims of the glass transition temperature of the copolymer.

Given that EP 767225 discloses copolymers identical to those presently claimed, i.e. obtained from the same types and amounts of monomers, it would have been natural for one of

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ordinary skill in the art to infer that the copolymers intrinsically possess the same glass transition temperature as presently claimed, and thereby arrive at the claimed invention. Evidence to support this position is found in *Polymer Science Dictionary* (page 526) which discloses that the value of the softening point for polymers lies in the vicinity of the glass transition temperature of the polymer. Given that EP 767225 discloses copolymer having softening temperature identical to that presently claimed, it is clear, in light of the teaching in *Polymer Science Dictionary*, that the glass transition temperature of the copolymer of EP 767225 will also overlap the glass transition temperature as presently claimed.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie Shosho whose telephone number is (703) 305-0208. The examiner can normally be reached on Mondays-Thursdays from 7:00 am to 4:30 pm. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan, can be reached on (703) 306-2777. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3599.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Callie Shosho
4/2/01

C.J.

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